



AIR QUALITY PERMITTING TECHNICAL MEMORANDUM

Tier II Operating Permit No. 083-00062

**LAMB WESTON, INC.
TWIN FALLS, IDAHO**

Prepared by:

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Project No. T2-010431

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FINAL PERMIT

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LIST OF ACRONYMS

ACFM	Actual Cubic Feet Per Minute
AFS	AIRS Facility Subsystem
AIRS	Aerometric Information Retrieval System
AQCR	Air Quality Control Region
BACT	Best Available Control Technology
CFR	Code of Federal Regulations
CO	Carbon Monoxide
DEQ	Idaho Department of Environmental Quality
dscf	Dry Standard Cubic Feet
EF	Emission Factor
EPA	United States Environmental Protection Agency
gpm	Gallons Per Minute
gr	Grain (1 lb = 7,000 grains)
HAPs	Hazardous Air Pollutants
IC	Integrated Chip
IDAPA	Idaho Administrative Procedures Act
km	Kilometer
lb/hr	Pound Per Hour
MACT	Maximum Available Control Technology
MMBtu	Million British thermal units
NESHAP	Nation Emission Standards for Hazardous Air Pollutants
NO ₂	Nitrogen Dioxide
NO _x	Nitrogen Oxides
NSPS	New Source Performance Standards
O ₃	Ozone
OP	Operating Permit
PM	Particulate Matter
PM ₁₀	Particulate Matter with an Aerodynamic Diameter of 10 Micrometers or Less
ppm	Parts Per Million
PSD	Prevention of Significant Deterioration
PTC	Permit To Construct
PTE	Potential To Emit
SCC	Source Classification Code
scf	Standard Cubic Feet
SIP	State Implementation Plan
SO ₂	Sulfur Dioxide
TSP	Total Suspended Particulates
T/yr	Tons Per Year
µm	Micrometers
VOC	Volatile Organic Compound

PURPOSE

The purpose for this memorandum is to satisfy the requirements of IDAPA 58.01.01, Section 404.04 (*Rules for the Control of Air Pollution in Idaho*) for Tier II operating permits. This technical memorandum serves as an addition to the technical memorandum dated June 16, 2000, included in Appendix C.

PROJECT DESCRIPTION

Lamb Weston is proposing to install a water heater, which will utilize the waste gas from an anaerobic digester, at its Twin Falls facility (856 Russet Street, Twin Falls). Lamb Weston is also proposing to install the capability to burn both 0.05% sulfur diesel and cooking oil as backup fuels in its boilers. Lamb Weston would like to remove the New Source Performance Standards size restriction that limits boiler No. 1 below 100 million British thermal units (MMBtu) per hour and rate the boiler at design specifications. Lamb Weston is proposing to operate the facility on an ongoing basis.

Lamb Weston requested the water heater portion of the application be processed expeditiously as an energy project consistent with Governor Kempthorne's Directive 2001-02, dated February 22, 2001. The directive instructs the Idaho Department of Environmental Quality (DEQ) to expedite review of applications for energy generation projects.

SUMMARY OF EVENTS

On September 27, 2001, DEQ received an application from Lamb Weston for installation of a water heater, which will burn biogas from an anaerobic digester. On October 26, 2001, the application was determined complete. On November 9, 2001, the consent order for the installation of a water heater utilizing waste biogas was signed on December 18, 2002, the draft permit was issued to the facility on January 7, 2002, the facility responded on February 19, 2002, the proposed permit was issued for public comment on April 2, 2002, the public comment period ended on May 1, 2002, the only comments received were from the facility.

DISCUSSION

1. Equipment Listing

The installation will include an American Heating Company water heater, model number AHC-1500, with a rated heat input capacity of 19 MMBtu/hr. The installation of the equipment necessary to burn both 0.05% sulfur diesel and cooking oil as backup fuels in boilers No. 1, No. 2, and No. 3. Boiler No. 1 is currently restricted below 100 MMBtu heat input per hour; the rated capacity of boiler No. 1 is 180 MMBtu heat input per hour.

2. Emission Estimates

The applicant provided emissions from the facility using emissions estimated from an analysis of the actual biogas and AP-42 values. The emissions in Table 1 are expected if the facility operates at maximum capacity for 8,760 hours per year (i.e., at the potential to emit). Emission calculations are provided in Appendix A.

Table 1. Potential Facility Emissions.

Pollutant	Emission Rate	
	lb/hr ¹	T/yr ²
VOCs ³ (as Total HC ⁴)	2.6	6.1
CO ⁵	31	54
NO ₂ ⁶	62	99
PM ₁₀ ⁷	6.3	11
SO ₂ ⁸	36	99

¹Pounds per hour

²Tons per year

³Volatile organic compounds

⁴Hydrocarbons

⁵Carbon monoxide

⁶Nitrogen oxides

⁷Particulate matter

⁸Sulfur dioxide

3. Modeling

The applicant modeled emissions using ISCST3 Version 00101 and regulatory default options. Surface meteorological data for Pocatello with mixing height data for Boise from the SCRAM Web site was used for the modeling. Pocatello surfaces data and Boise mixing height data for 1987–1991 was used because it is the most recent and applicable data available.

Estimated concentrations from the proposed project were combined with background concentrations to determine the total ambient concentrations for each pollutant. When running all sources at the facility at maximum capacity, modeling predicts none of the criteria pollutants will exceed their respective ambient air quality standards. In addition, toxic air pollutants from the facility will not exceed any Acceptable Ambient Concentration (AAC). Therefore, the project is expected to be in compliance with all ambient air quality standards. Modeling results are provided in Appendix B.

4. Facility Classification

This facility is a potato product manufacturer, Standard Industrial Classification code 2099. Per IDAPA 58.01.01.006.55 a major facility is any facility, which emits, or has the potential to emit, 100 T/yr or more of any regulated air pollutant. This facility is adopting production/operating restrictions, which keeps the facility below the major facility threshold. The facility is not a major facility and is considered a synthetic minor facility since it chooses to stay under the major threshold.

5. Area Classification

Twin Falls is located in Twin Falls County, Air Quality Control Region 63, UTM Zone 11. Twin Falls County is designated as unclassifiable for all criteria air pollutants.

6. Regulatory Review

IDAPA 58.01.01.201

Permit to Construct Required

A permit to construct will be required for this source. The Tier II operating permit will contain PTC requirements. A PTC will not be specifically issued, since the Tier II permit will address all PTC issues.

IDAPA 58.01.01.210 Demonstration of Preconstruction Compliance with Toxic Standards

Toxic emissions were estimated by the applicant using AP-42 or biogas analysis emission factors. The toxic emissions do not exceed their AACs in IDAPA 58.01.01.586.

IDAPA 58.01.01.401 Tier II Operating Permit

The use of a potential to emit limitation to exempt the facility from Tier I permitting requirements is authorized.

IDAPA 58.01.01.403 Permit Requirements for Tier II Sources

Tier II sources must comply with all applicable local, state, or federal emission standards. The source will not cause or significantly contribute to a violation of any ambient air quality standard.

IDAPA 58.01.01.404.01(c) Opportunity for Public Comment

An opportunity for public comment shall be provided on Tier II operating permits. Since there is an increase in emissions a public comment period is required.

IDAPA 58.01.01.404.04 Authority to Revise or Renew Operating Permits

The director may approve a revision of any Tier II operating permit or renewal of any Tier II operating permit provided the stationary source or facility continues to meet all applicable requirements of Sections 400 through 406.

IDAPA 58.01.01.406 Obligation to Comply

Receiving a Tier II operating permit shall not relieve any owner or operator of the responsibility to comply with all applicable local, state, and federal rules and regulations.

IDAPA 58.01.01.470 Permit Application Fees for Tier II Permits

Any person applying for a Tier II permit shall pay permit application fees of \$500 for each permit requested or amended.

IDAPA 58.01.01.577 Ambient Air Quality Standards for Specific Air Pollutants

Emissions of pollutants listed in IDAPA 58.01.01.577 were shown to be in compliance with the ambient air quality standards. See Appendix B.

IDAPA 58.01.01.625 Visible Emission Limitation

A person shall not discharge any air pollutant into the atmosphere from any point of emission for a period or periods aggregating more than three minutes in any 60-minute period which is greater than 20% opacity.

IDAPA 58.01.01.650 General Rules for the Control of Fugitive Dust

All reasonable precautions shall be taken to prevent the generation of fugitive dust.

40 CFR 60 New Source Performance Standards

40 CFR 60 Subpart Db, Standards of Performance for Industrial-Commercial-Institutional Steam Generating Units, states: *"The affected facility to which this subpart applies is each steam generating unit that commences construction, modification or reconstruction after June 19, 1984, and that has a heat input capacity from fuels combusted in the steam generating unit of greater than 29 MW (100 million Btu/hour)."*

Boiler No. 1 was constructed in 1989 and the rated capacity is 180 MMBtu heat input per hour. New Source Performance Standards contained in 40 CFR 60 are applicable for boiler No. 1.

40 CFR 61 and 63 National Emission Standards for Hazardous Air Pollutants and Maximum Achievable Control Technology

No subparts of 40 CFR 61 or 63 are applicable.

7. Permit Requirements

7.1 Emission Limits

Emission limits on specific air pollutants are set at the potential to emit as show in Table II below.

Table 2. Potential Facility Emissions.

Pollutant	Emission Rate	
	lb/hr	T/yr ²
VOCs ³ (as Total HC ⁴)	2.6	6.1
CO ⁵	31	54
NO ₂ ⁶	62	99
PM ₁₀ ⁷	6.3	11
SO ₂ ⁸	36	99

¹Pounds per hour

²Tons per year

³Volatile organic compounds

⁴Hydrocarbons

⁵Carbon monoxide

⁶Nitrogen oxides

⁷Particulate matter

⁸Sulfur dioxide

7.2 Operating Requirements

Combined NO_x emissions from the entire facility shall not exceed 99 tons/year. The NO_x emissions shall be calculated monthly for the previous 12 months. The NO_x calculations shall be made using the following table:

Table 3. NO_x Emissions Calculations

Source	Fuel Usage (previous 12 months)	Emission Factor	Emissions
Boiler 1 Natural Gas	MMCF x	83.73 lb/MMCF =	Lbs
Rest of Plant Natural Gas	MMCF x	100 lb/MMCF =	Lbs
Waste Gas	MMCF x	100 lb/MMCF =	Lbs
Total Diesel	Gallons x	20 lb/1000 gal =	Lbs
Total Vegetable Oil	Gallons x	25 lb/1000 gal =	Lbs
Total =			Lbs Tons

Combined SO₂ emissions from the entire facility shall not exceed 99 tons/year. The SO₂ emissions shall be calculated monthly for the previous 12 months. The SO₂ calculations shall be made using the following table:

Table 4. SO₂ Emissions Calculations

Source	Fuel Usage (previous 12 months)	Emission Factor	Emissions
Boiler 1 Natural Gas	MMCF x	0.6 lb/MMCF =	Lbs
Rest of Plant Natural Gas	MMCF x	0.6 lb/MMCF =	Lbs
Waste Gas ¹	MMCF x	1015 lb/MMCF =	Lbs
Total Diesel	Gallons x	7.1 lb/1000 gal =	Lbs
Total Vegetable Oil	Gallons x	0.11 lb/1000 gal =	Lbs
Total =			Lbs Tons

¹Waste gas emission factor needs to be assured. 1,015 lb/MMCF is based on an H₂S concentration of 6,100 ppm by volume.

8. Permit Coordination

Currently, Lamb Weston operates one other permitted facility within the state of Idaho, located in American Falls.

9. Aerometric Information Retrieval System (AIRS) Information

AIRS/AFS FACILITY-WIDE CLASSIFICATION¹ DATA ENTRY FORM

AIR PROGRAM	SIP ²	PSD ³	NSPS ⁴ (Part 60)	NESHAP ⁵ (Part 61)	MACT ⁶ (Part 63)	TITLE V	AREA CLASSIFICATION A – Attainment U – Unclassifiable N – Nonattainment
POLLUTANT ⁷							
SO ₂ ⁷	SM		SM				U
NO _x ⁸	SM		SM				U
CO ⁹	B						U
PM ₁₀ ¹⁰	B						U
PT ¹¹	B		B				U
VOC ¹²	B						U
THAP ¹³							
			APPLICABLE SUBPART				
			Db				

¹AIRS/AFS CLASSIFICATION CODES:

- A = Actual or potential emissions of a pollutant are above the applicable major source threshold. For NESHAP only, class "A" is applied to each pollutant which is below the 10 ton-per-year (T/yr) threshold, but which contributes to a plant total in excess of 25 T/yr of all NESHAP pollutants.
- SM = Potential emissions fall below applicable major source thresholds if and only if the source complies with federally enforceable regulations or limitations.
- B = Actual and potential emissions below all applicable major source thresholds.
- C = Class is unknown.
- ND = Major source thresholds are not defined (e.g., radionuclides).

²State Implementation Plan

³Prevention of Significant Deterioration

⁴New Source Performance Standards

⁵National Emission Standards for Hazardous Air Pollutants

⁶Maximum Achievable Control Technology

⁷Sulfur Dioxide

⁸Nitrogen Oxides

⁹Carbon Monoxide

¹⁰Particulate matter with an aerodynamic diameter less than or equal to ten micrometers

¹¹Particulate

¹²Volatile Organic Compounds

¹³Total Hazardous Air Pollutants

FEES

Fees apply to this facility in accordance with IDAPA 58.01.01.470. The facility is subject to permit application fees for this revised Tier II operating permit of \$500.

RECOMMENDATIONS

Based on the review of the application materials, and all applicable state and federal regulations, staff recommends that DEQ issue a final Tier II operating permit to Lamb Weston. An opportunity for public comment on the air quality aspects of the proposed operating permit was provided in accordance with IDAPA 58.01.01.404.01.c. Lamb Weston has paid the required Tier II application fee of \$500.

APPENDIX A

Lamb Weston, Twin Falls

Emission Calculations

Lamb-Weston, Twin Falls
Waste Gas and Maximum Natural Gas Calculations

Natural Gas Btu/Hr = 1,020

Waste Gas Btu/Hr = 840

Natural Gas

Component	Maximum BTU Heat Input/Hr	Full Load Capacity		Natural Gas			Maximum Natural Gas per Year
		MMCF/Hr	MMCF/Yr	Btu/Hr	MMCF/Hr	MMCF/Yr	
BOILER No. 1	180,000,000	0.1785	1,545.88			1,545.88	Increased Capacity Remaining natural gas that can be burned and not exceed 99 tons/yr NO _x . This gas could be burned in any fuel burning equipment. Tier II Permit Tier II Permit Tier II Permit Tier II Permit Tier II Permit Remaining natural gas capacity when waste gas is burned at capacity
BOILER No. 2	72,000,000	0.0708	618.35			230.52	
BOILER No. 3	36,000,000	0.0353	309.18				
HEATERS & BURNERS	108,800,000	0.1067	934.40			75.00	
LINE 1 DRYER	36,000,000	0.0353	309.18			64.94	
LINE 2 PRE DRYER	4,000,000	0.0039	34.35			14.12	
LINE 4 DRYER	27,500,000	0.0270	236.18			91.76	
SPECIAL PRODUCTS DRYER	2,000,000	0.0020	17.18			14.82	
WASTE GAS HEATER	18,000,000	0.0186	163.18	2,000,000	0.0020	17.18	
Total		0.457	4,004.89			2,054.23	
Total without Boiler 1		0.299	2621.988			506.35	
Total without Boilers and Waste Gas Heater		0.175	1,531.28			260.65	

Waste Gas

WASTE GAS HEATER	17,000,000	0.0202	177.29			177.29	Waste Gas Capacity
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Emission Factors

(AP-42 Emission Factors are the most current.)

Waste Gas sampling performed on 2/21/01 showed an average H₂S concentration of 6100 ppm by volume. This was converted to lb/MMCF by MW/385.1 = 6100 x (34.09/385.1) = 540 lb/MMCF H₂S. It is assumed that all the H₂S is converted to SO₂. The MW ratio of SO₂ to H₂S is 1.88 (64.06/34.08). 540 lb/MMCF x 1.88 = 1015 lb/MMCF SO₂.

	Source	PM lb/MMCF	PM ₁₀ lb/MMCF	SO ₂ lb/MMCF	CO lb/MMCF	NO _x lb/MMCF	VOC lb/MMCF
WASTE GAS	Analysis & AP-42	7.6	7.6	1015	84	100	5.5
	AP-42	AP-42	AP-42	Analysis	AP-42	AP-42	AP-42
BOILER NO. 1	Test & AP-42	7.6	7.6	0.6	33.2	83.73	5.5
	AP-42	AP-42	AP-42	AP-42	Source Test	Source Test	AP-42
OTHER EQUIPMENT	AP-42	7.6	7.6	0.6	84	100	5.5

Emissions

The 20.54 lb/hr SO₂ estimate for waste gas is greater than the maximum 18.5 lb/hr emission estimate shown in the City of Twin Falls Waste Gas Flare Permit to Construct Application

	PM		PM ₁₀		SO ₂		CO		NO _x		VOC	
	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr
Boiler 1	1.34	5.87	1.34	5.87	0.11	0.46	5.86	25.86	14.78	64.72	0.97	4.25
Boiler 2	0.54	0.88	0.54	0.88	0.04	0.07	5.93	8.88	7.06	11.63	0.39	0.63
Boiler 3	0.27		0.27		0.02		2.96		3.53		0.19	
Waste Gas (Waste Gas)	0.15	0.67	0.15	0.67	20.54	89.95	1.70	7.45	2.02	8.86	0.11	0.49
Waste Gas (Natural Gas)	0.01	0.07	0.01	0.07	0.001	0.01	0.16	0.72	0.20	0.88	0.01	0.05
Rest of Plant Natural Gas	1.33	0.89	1.33	0.99	0.10	0.08	14.88	10.95	17.46	13.03	0.96	0.72
Total	3.64	6.48	3.64	6.48	20.81	90.56	31.30	54.48	45.06	99.00	2.64	6.14

Proposed Permit Calculations

	SO ₂ Calculations			NO _x Calculations		
		Emission Factor	Emissions		Emission Factor	Emissions
Boiler 1 Natural Gas for Previous 12 Months	1,545.88 MMCF x	0.6 lb/MMCF =	928 lbs	1,545.88 MMCF x	83.73 lb/MMCF =	129,437 lbs
Rest of Plant Natural Gas for Previous 12 Months	506.35 MMCF x	0.6 lb/MMCF =	304 lbs	506.35 MMCF x	100 lb/MMCF =	50,635 lbs
Waste Gas for Previous 12 Months	177.29 MMCF x	1015 lb/MMCF =	179,891 lbs	177.29 MMCF x	100 lb/MMCF =	17,729 lbs
Diesel Used for Previous 12 Months	Gallons x	7.1 lb/1000 gal =	lbs	Gallons x	20 lb/1000 gal =	lbs
Cooking Oil Used for Previous 12 Months	Gallons x	0.11 lb/1000 gal =	lbs	Gallons x	25 lb/1000 gal =	lbs
Total			181,123 lbs			198,000 lbs
			90.56 tons			99.00 tons

Lamb-Weston, Twin Falls Diesel Calculations

Proposed Permit Calculations

	SO ₂ Calculations			NO _x Calculations		
		Emission Factor	Emissions		Emission Factor	Emissions
Boiler 1 Natural Gas for Previous 12 Months	0.00 MMCF x	0.6 lb/MMCF =	0 lbs	0.00 MMCF x	63.73 lb/MMCF =	0 lbs
Natural Gas for Previous 12 Months	0.00 MMCF x	0.6 lb/MMCF =	0 lbs	0.00 MMCF x	100 lb/MMCF =	0 lbs
Waste Gas for Previous 12 Months	0.00 MMCF x	1015 lb/MMCF =	0 lbs	0.00 MMCF x	100 lb/MMCF =	0 lbs
Diesel Used for Previous 12 Months	9,900,000 Gallons x	7.1 lb/1000 gal =	70,290 lbs	9,900,000 Gallons x	20 lb/1000 gal =	198,000 lbs
Cooking Oil Used for Previous 12 Months	Gallons x	0.11 lb/1000 gal =	0 lbs	Gallons x	25 lb/1000 gal =	0 lbs
		Total =	70,290 lbs 35.15 tons		Total =	198,000 lbs 99.00 tons

Calculation of Actual Emissions

	Maximum Btu Heat Input/hr	Diesel			
		Full Load Capacity		Boiler Maximum	Plant Maximum
		1000 gal/hr	1000 gal/yr	1000 gal/yr	1000 gal/yr
Boiler 1	180,000,000	1.31	11,508	9,900	
Boiler 2	72,000,000	0.53	4,604	4,604	
Boiler 3	36,000,000	0.26	2,302	2,302	
Total	288,000,000	2.102	18,415		9,900

Diesel Btu/gal = 137,000

Emission Factors

(AP-42 Emission Factors are the most current.)

	% Sulfur	PM lb/1000 gal	PM ₁₀ lb/1000 gal	SO ₂ lb/1000 gal	CO lb/1000 gal	NO _x lb/1000 gal	VOC lb/1000 gal
Boilers	0.05	3.3	2.3	7.1	5	20	0.2

Maximum Plant Emissions Burning Only Diesel in Boilers 1, 2 & 3

	Fuel	PM		PM ₁₀		SO ₂		CO		NO _x		VOC	
		lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr
Boilers	Diesel	6.94	16.34	4.64	11.39	14.93	35.15	10.51	24.75	42.04	99.00	0.42	0.99
Waste Heater	Waste Gas	0.15	0.00	0.15	0.00	20.54	0.00	1.70	0.00	2.02	0.00	0.11	0.00
Rest of Plant	Natural Gas	1.33	0.00	1.33	0.00	0.10	0.00	14.68	0.00	17.46	0.00	0.96	0.00
Total Fuel Burning		8.42	16.34	6.32	11.39	35.57	35.15	26.89	24.75	61.55	99.00	1.49	0.99

Maximum Emissions per Boiler Burning Only Diesel

	PM		PM ₁₀		SO ₂		CO		NO _x		VOC	
	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr
Boiler 1	4.34	16.34	3.02	11.39	9.33	35.15	6.57	24.75	26.26	99.00	0.26	0.99
Boiler 2	1.73	7.60	1.21	5.29	3.73	16.34	2.63	11.51	10.51	46.04	0.11	0.46
Boiler 3	0.87	3.60	0.60	2.65	1.67	8.17	1.31	5.75	5.26	23.02	0.05	0.23

Lamb-Weston, Twin Falls Cooking Oil Calculations

Proposed Permit Calculations

	SO ₂ Calculations			NO _x Calculations		
		Emission Factor	Emissions		Emission Factor	Emissions
Boiler 1 Natural Gas for Previous 12 Months	0.00 MMCF x	0.0 lb/MMCF =	0 lbs	0.00 MMCF x	83.73 lb/MMCF =	0 lbs
Natural Gas for Previous 12 Months	0.00 MMCF x	0.0 lb/MMCF =	0 lbs	0.00 MMCF x	100 lb/MMCF =	0 lbs
Waste Gas for Previous 12 Months	0.00 MMCF x	1015 lb/MMCF =	0 lbs	0.00 MMCF x	100 lb/MMCF =	0 lbs
Diesel Used for Previous 12 Months	0 Gallons x	7.1 lb/1000 gal =	0 lbs	0 Gallons x	20 lb/1000 gal =	0 lbs
Cooking Oil Used for Previous 12 Months	7,920,000 Gallons x	0.11 lb/1000 gal =	871 lbs	7,920,000 Gallons x	25 lb/1000 gal =	198,000 lbs
		Total =	871 lbs		Total =	198,000 lbs
			0.44 tons			99.00 tons

Calculation of Actual Emissions

	Maximum Btu Heat Input/hr	Diesel			
		Full Load Capacity		Boiler Maximum	Plant Maximum
		1000 gal/hr	1000 gal/yr	1000 gal/yr	1000 gal/yr
Boiler 1	180,000,000	1.38	12,128	7,920	
Boiler 2	72,000,000	0.55	4,852	4,852	
Boiler 3	36,000,000	0.28	2,426	2,426	
Total	288,000,000	2.215	19,407		7,920

Cooking Oil Btu/gal = 130,000

Emission Factors

Source	PM lb/1000 gal	PM ₁₀ lb/1000 gal	SO ₂ lb/1000 gal	CO lb/1000 gal	NO _x lb/1000 gal	VOC lb/1000 gal
Boilers Test & AP-42	1.69	1.69	0.11	5	25	0.13

Emissions Burning Only Cooking Oil in Boilers 1, 2 & 3

Fuel		PM		PM ₁₀		SO ₂		CO		NO _x		VOC	
		lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr
Boilers	Cooking Oil	3.74	6.69	3.74	6.69	0.24	0.44	11.08	19.80	56.38	99.00	0.29	0.51
Waste Gas Heater	Waste Gas	0.15	0.00	0.15	0.00	20.54	0.00	1.70	0.00	2.02	0.00	0.11	0.00
Rest of Plant	Natural Gas	1.33	0.00	1.33	0.00	0.10	0.00	14.68	0.00	17.48	0.00	0.96	0.00
Total Fuel Burning		5.23	6.69	5.23	6.69	20.88	0.44	27.46	19.80	74.89	99.00	1.36	0.51

Maximum Emissions per Boiler Burning Only Cooking Oil

	PM		PM ₁₀		SO ₂		CO		NO _x		VOC	
	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr
Boiler 1	2.34	6.69	2.34	6.69	0.15	0.44	6.92	19.80	34.62	99.00	0.18	0.51
Boiler 2	0.94	4.10	0.94	4.10	0.06	0.27	2.77	12.13	13.86	60.66	0.07	0.32
Boiler 3	0.47	2.05	0.47	2.05	0.03	0.13	1.36	6.06	6.92	30.32	0.04	0.16

Lamb-Weston, Twin Falls
Boiler 1 Toxic Air Pollutants

Natural Gas

Reference: AP-42 section 1.4 (3/98) Emission Factors for Industrial Boilers Burning Natural Gas

Heat Input 180.00 10⁶ Btu/hr
Natural Gas 1,020 Btu/cf

Pollutant	Factor		Emission Rate lb/hr	EL lb/hr	Greater Than EL	Toxic Class	Annual Average Emissions lb/hr	Modeled Impact ug/m3	AACC ug/m3	Greater Than AACC
	lb/10 ⁶ CF	lb/10 ⁶ Btu								
Arsenic	0.0002	1.96E-07	3.53E-05	1.50E-06	Yes	A	3.53E-05	2.72E-05	2.30E-04	No
Barium	4.40E-03	4.31E-06	7.78E-04	3.30E-02	No	B				
Benzene	0.0021	2.06E-06	3.71E-04	8.00E-04	No	A				
Beryllium	0.000012	1.18E-08	2.12E-06	2.80E-05	No	A				
Cadmium	0.0011	1.08E-06	1.94E-04	3.70E-06	Yes	A	1.94E-04	1.49E-04	5.80E-04	No
Chromium	0.0014	1.37E-06	2.47E-04	0.000	Yes	A	2.47E-04	1.90E-04	8.30E-04	No
Chromium II & III				0	No					
Cobalt	8.40E-05	8.24E-08	1.48E-05	3.30E-03	No	B				
Copper	0.00085	8.33E-07	1.50E-04	0.013	No	B				
Formaldehyde	0.075	7.35E-05	1.32E-02	0.001	Yes	A	1.32E-02	1.02E-02	7.70E-02	No
Hexane (n,hexane)	1.80E+00	1.78E-03	3.18E-01	12.00	No	B				
Manganese	3.80E-04	3.73E-07	6.71E-05	0	No	B				
Mercury	2.60E-04	2.55E-07	4.59E-05	0	No	B				
Molybdenum	1.10E-03	1.06E-06	1.94E-04	1	No	B				
Naphthalene	8.10E-04	5.98E-07	1.08E-04	3.33E+00	No	B				
Nickel	2.10E-03	2.06E-06	3.71E-04	2.70E-05	Yes	A	3.71E-04	2.85E-04	4.20E-03	No
NO		3.80E-02	6.48E+00	8	Yes	B				
Pentane	2.60E+00	2.55E-03	4.59E-01	118	No	B				
Phosphorus	2.10E-03	2.06E-06	3.71E-04	0.007	No	B				
Selenium	2.40E-05	2.35E-06	4.24E-06	0.013	No	B				
Toluene	3.40E-03	3.33E-06	6.00E-04	25	No	B				
Vanadium	2.30E-03	2.25E-06	4.06E-04	0.003	No	B				
Polycyclic aromatic hydrocarbon (PAH)	1.14E-05	1.12E-06	2.01E-06	9.10E-05	No	A				
PAH Emission Factor is the sum of the following substances in accordance with IDAPA 58.01.01.500 Table										
Benz(a)anthracene	1.80E-06	1.76E-09								
Benzo(a)pyrene	1.20E-06	1.18E-09								
Benzo(b)fluoranthene	1.80E-06	1.76E-09								
Benzo(k)fluoranthene	1.80E-06	1.76E-09								
Chrysene	1.80E-06	1.76E-09								
Dibenzo(a,h)anthracene	1.20E-06	1.18E-09								
Indeno(1,2,3-cd)pyrene	1.80E-06	1.76E-09								

Lamb-Weston, Twin Falls
Boiler 2 Toxic Air Pollutants

Diesel

Reference: AP-42 Section 1.3 (9/98) Emission Factors for Industrial Boilers Burning Distillate Oil

Heat Input 72 10⁶ Btu/hr

Pollutant	Factor		Emission Rate lb/hr	EL lb/hr	Greater Than EL	Toxic Class	Annual Average Emissions lb/hr	Modeled Impact ug/m3	AACC ug/m3	Greater Than AACC
	lb/10 ⁶ Gal	lb/10 ⁶ Btu								
Arsenic		4.00E-06	2.88E-04	1.50E-06	Yes	A	2.88E-04	1.54E-04	2.30E-04	No
Benzene	2.14E-04	1.56E-06	1.12E-04	8.00E-04	No	A				
Beryllium		3.00E-06	2.16E-04	2.80E-05	Yes	A	2.16E-04	2.10E-05	4.20E-03	No
Cadmium		3.00E-06	2.16E-04	3.70E-06	Yes	A	2.16E-04	2.10E-05	5.80E-04	No
Chromium VI (Est. from No. 6 Oil Ratio)		8.80E-07	6.34E-05	5.60E-07	Yes	A	6.34E-05	6.16E-06	8.30E-04	No
Chromium II & III (Est. from No. 6 Oil Ratio)		2.12E-06	1.53E-04	0.033	No	B				
Ethylbenzene	6.36E-05	4.64E-07	3.34E-05	29	No	B				
Formaldehyde	6.10E-02	4.45E-04	3.21E-02	5.10E-04	Yes	A	3.21E-02	3.11E-03	7.70E-02	No
Manganese		6.00E-06	4.32E-04	0.067	No	B				
Mercury		3.00E-06	2.16E-04	0.003	No	B				
Naphthalene	1.13E-03	8.25E-06	5.94E-04	3.33	No	B				
Nickel		3.00E-06	2.16E-04	2.70E-06	Yes	A	2.16E-04	2.10E-05	4.20E-03	No
Toluene	6.20E-03	4.53E-05	3.26E-03	25	No	B				
1,1,1 Trichloroethane (Methyl chloroform)	2.38E-04	1.72E-06	1.24E-04	127	No	B				
o-Xylene	1.08E-04	7.96E-07	5.73E-05	29	No	B				
Polycyclic aromatic hydrocarbon (PAH)	1.17E-05	8.53E-06	6.14E-05	9.10E-05	No	A				
PAH Emission Factor is the sum of the following substances in accordance with IDAPA 58.01.01.566 Table										
Benz(a)anthracene		4.01E-06								
Benzo(b,k)fluoranthene		1.48E-06								
Chrysene		2.38E-06								
Dibenzo(a,h)anthracene		1.67E-06								
Indeno(1,2,3-cd)pyrene		2.14E-06								

APPENDIX B

Lamb Weston, Twin Falls

Modeling

MODELING REPORT FOR LAMB-WESTON, TWIN FALLS WASTE GAS HEATER ADDITION

BACKGROUND

The modeling was carried out to demonstrate that the Lamb-Weston, Twin Falls Plant does not cause a violation of a National Ambient Air Quality Standard with the addition of the Waste Gas Heater. This demonstration is required by Idaho Administrative Code IDAPA 58.01.01.403.02, Permit Requirements for Tier II Sources, NAAQS. Modeling was performed for the criteria pollutants of SO₂, NO_x and PM₁₀ and for toxic air pollutants from burning diesel in Boilers 1, 2 and 3 and burning natural gas in Boiler 1.

DISCUSSION OF SOURCE EMISSION INVENTORY

The Twin Falls Lamb-Weston Plant processes potatoes. There are seven product lines producing four different products. Four of the product lines (Lines 1, 2, 4, and special products) produce fried products, two product lines (hashbrown and Line 3) produce hashbrown potatoes, and one product line produces mash potatoes.

With the addition of the waste gas heater, there are 19 fuel burning sources which emit SO₂ and NO_x and 29 point sources that emit PM₁₀. The sources modeled are listed in the Modeled Source Parameters Table in Attachment A, Pages 1 and 2. The fugitive PM₁₀ sources of the space heaters, material handling and road emissions were not modeled.

With the exception of the emergency diesels, the modeling used the estimated hourly emissions for each source at its capacity. For NO_x and PM₁₀ annual modeling, the average hourly emissions were based on 500 hours of emergency diesel operation per year. For PM₁₀ 24-hour modeling, the average hourly emissions were based on 8.5 hours of emergency diesel operations per day. These emissions were the same as used for the Tier II permit modeling.

For modeling the toxic air pollutants which exceeded the IDAPA 58.01.01.585 and 586 screening emission levels (EL), the emission rate for arsenic from diesel burning was modeled for Boilers 1, 2 and 3 and the emission rate for chromium from natural gas burning was modeled for Boiler 1. The other pollutants which exceeded the EL were calculated by their emission ratio to either arsenic or chromium. Since the capacity on natural gas is not changing for Boilers 2 and 3, analysis for toxic air pollutants burning natural gas was not performed for these boilers. To provide more accurate results, the emission rates were multiplied by 10,000, the model was run and the results were divided by 10,000 and compared with the acceptable ambient concentration (AAC) for each pollutant that exceeded the EL.

DESCRIPTION OF THE SOURCE'S ENVIRONMENT

The modeled buildings are shown projected on a 1994 aerial photo of the site in Attachment A, Page 3. The modeled emission points are shown on the Modeled Emission Points Drawing in Attachment A, Page 4. The buildings and roof heights used in the modeling are shown on the Modeled Buildings and Roof Heights Drawing in Attachment A, Page 5.

The terrain surrounding the plant is shown on the Sensitive Receptor Location Map in Attachment A, Page 6.

MODELING METHODOLOGY

The EPA ISCST3, Version 00101, model was used. The model was run using the regulatory default options.

Surface meteorological data for Pocatello with mixing height data for Boise from the EPA SCRAM Website was used for the modeling. Twin Falls is located halfway between Pocatello and Boise. Pocatello surface data and Boise mixing height data for the years 1987-1991 was used because those are the latest years available.

The plant is in a rural area based on the Twin Falls and Filer USGS maps showing less than 50% of the area within 3 kilometers surrounding the plant as being industrial, commercial or compact residential.

The modeling was performed using a 90 meter grid spacing centered on the main plant building. The initial grid array was 2000 meters by 2000 meters. An approximately 30 meter grid spacing was used along the site property lines. Additional points were located at schools, kindergartens, day cares, nursing homes and hospitals within 2.5 miles (4 km) of the plant. The locations of these Sensitive Receptors are shown on the Sensitive Receptor Location Map in Attachment A, Page 6. A grid spacing of 30 meters was used to locate the maximum impacts close to the plant. The grids exclude points within the plant property lines and points which fall within the boundaries of the modeled buildings. All grid points except for the fenceline points correspond to USGS Digital Elevation Model (DEM) data points.

Adjacent buildings modeled included Henningsen Cold Storage, Longview Fibre and The Farm House Collection.

MODELING RESULTS

Maps showing the results of the modeling runs are included in the attachments. The maps show the peak modeled value for each receptor and the year of the peak value. Input files, output files, the meteorological files and the terrain files are on the CDROM at the end of the report.

The modeling results were added to the background concentrations for Twin Falls which were provided by IDEQ to determine if the National Ambient Air Quality Standards (NAAQS) are exceeded. For SO₂ 3-hour and 24-hour averages and PM₁₀ 24-hour average, the second high for each year was used for comparison with the NAAQS. The following tables show the results of the modeling for each year and compare the results with the NAAQS:

SO₂ Modeling Results

Year	Annual			24-Hour			3-Hour		
	Model ug/m ³	Background (18.3 ug/m ³) plus Model	NAAQS ug/m ³	2nd High ug/m ³	Background (120 ug/m ³) plus Model	NAAQS ug/m ³	2nd High ug/m ³	Background (374 ug/m ³) plus Model	NAAQS ug/m ³
		Results ug/m ³			Results ug/m ³			Results ug/m ³	
1987	28.2	46.5	80	111.8	231.8	365	589.2	943.2	1300
1988	28.0	46.3	80	138.0	258.0	365	828.8	1202.6	1300
1989	25.3	43.6	80	152.8	272.8	365	669.6	1043.6	1300
1990	25.3	43.6	80	130.8	250.8	365	579.1	953.1	1300
1991	28.4	46.7	80	145.6	265.6	365	587.6	941.6	1300

PM₁₀ Modeling Results

Year	Annual			24-Hour		
	Model ug/m ³	Background (24.1 ug/m ³) plus Model	NAAQS ug/m ³	2nd High ug/m ³	Background (94 ug/m ³) plus Model	NAAQS ug/m ³
		Results ug/m ³			Results ug/m ³	
1987	12.1	36.2	50	50.2	144.2	150
1988	14.6	38.7	50	51.4	145.4	150
1989	11.3	35.4	50	46.3	140.3	150
1990	12.6	36.7	50	49.7	143.7	150
1991	12.7	36.8	50	55.2	149.2	150

NO_x Modeling Results

Year	Annual		
	Model ug/m ³	Background (40 ug/m ³) plus Model	NAAQS ug/m ³
		Results ug/m ³	
1987	24.4	64.4	100
1988	24.1	64.1	100
1989	21.7	61.7	100
1990	22.5	62.5	100
1991	24.5	64.5	100

The highest 2nd high 3-hour average SO₂ result was 828.6 µg/m³ in 1988. The location is shown in Attachment B, Page 2. Adding the 3-hour background of 374 µg/m³ results in an estimated highest 2nd high 3-hour SO₂ impact of 1202.6 µg/m³ which is less than the NAAQS limit of 1300 µg/m³.

The highest 2nd high 24-hour average SO₂ result was 152.8 µg/m³ in 1989. The location is shown in Attachment B, Page 6. Adding the 24-hour background of 120 µg/m³ results in an estimated highest 2nd high 24-hour SO₂ impact of 272.8 µg/m³ which is less than the NAAQS limit of 365 µg/m³.

The highest annual average SO₂ result from the modeling was 28.4 µg/m³ for 1991. The location is shown in Attachment B, Page 10. Adding the annual background of 18.3 µg/m³ results in an estimated maximum annual impact of 46.7 µg/m³ which is less than the NAAQS limit of 80 µg/m³.

The highest 2nd high 24-hour average PM₁₀ result was 55.2 µg/m³ in 1991. The location is shown in Attachment C, Page 1. Adding the 24-hour background of 94 µg/m³ results in an estimated highest 2nd high 24-hour impact of 149.2 µg/m³ which is less than the NAAQS limit of 150 µg/m³.

The highest annual average PM₁₀ result from the modeling was 14.6 µg/m³ for 1988. The location is shown in Attachment C, Page 6. Adding the annual background of 24.1 µg/m³ results in an estimated maximum annual impact of 38.7 µg/m³ which is less than the NAAQS limit of 50 µg/m³.

The highest annual average NO_x result from the modeling was 24.5 µg/m³ for 1991. The location is shown in Attachment D, Page 2. Adding the annual background NO_x of 40 µg/m³ results in an estimated maximum annual impact of 64.5 µg/m³ which is less than the NAAQS limit of 100 µg/m³.

Modeling was also performed for sensitive receptors. The results are shown on the table below and the locations are shown on the maps in the attachments.

Sensitive Receptors

	Maximum ug/m3	Year	Location
SO ₂ 3-Hour	85.63	1991	Magic Valley Alternative School
SO ₂ 24-Hour	28.75	1991	Magic Valley Alternative School
SO ₂ Annual	6.06	1988	Magic Valley Alternative School
PM ₁₀ 24-Hour	13.47	1989	Magic Valley Alternative School
PM ₁₀ Annual	2.72	1990	Magic Valley Alternative School
NO _x Annual	5.45	1988	Magic Valley Alternative School

The modeled toxic air pollutant that came closest to the AAC was arsenic for Boiler 3. The modeled impact was 1.89E-04 µg/m³ which is less than the AAC of 2.3E-04 µg/m³.

CONCLUSION

The modeling was carried out to demonstrate that the Lamb-Weston, Twin Falls Plant does not cause a violation of a National Ambient Air Quality Standard with the addition of the waste gas heater. This demonstration is required by Idaho Administrative Code IDAPA 58.01.01.403.02, Permit Requirements for Tier II Sources, NAAQS. The modeling results show that a National Ambient Air Quality Standard will not be exceeded. The 24-hour PM_{10} standard of $150 \mu\text{g}/\text{m}^3$ is the closest limit approached with a maximum estimated 2nd high concentration of $149.2 \mu\text{g}/\text{m}^3$ when a background 24-hour concentration of $94 \mu\text{g}/\text{m}^3$ is added to the modeling results of $55.2 \mu\text{g}/\text{m}^3$.

Modeling was also performed to demonstrate that the toxic air pollutant limits of IDAPA 58.01.01.585 and 586 were not violated by the additional capability of burning diesel fuel in Boilers 1, 2 and 3 and the increase in capacity to burn natural gas in Boiler 1. The results showed that the acceptable ambient concentrations (AAC) will not be exceeded by these additions.

APPENDIX C

Lamb Weston, Twin Falls

June 16, 2000 Technical Memorandum

October 6, 2000

MEMORANDUM

TO: Doug Howard, Regional Administrator
Twin Falls Regional Office

FROM: Harbi Elshafei, Air Quality Engineer
Process Engineering Group
State Technical Services

THROUGH: Daniel Salgado, Discipline Lead
Process Engineering Group
State Technical Services

SUBJECT: Technical Analysis for Tier II Operating Permit (#083-00062)
Lamb-Weston, Inc. (Twin Falls)

PURPOSE

The purpose of this memorandum is to satisfy the requirements of IDAPA 58.01.01.400 (*Rules for the Control of Air Pollution in Idaho*) for issuing Tier II Operating Permits (OP).

FACILITY DESCRIPTION

Lamb-Weston, Inc., located in Twin Falls, Idaho, processes raw potatoes into frozen fried, hashbrown, mashed and special potato products for consumer sales. The facility consists of the following processes:

➤ Seven (7) product lines, as follows:

Line 1, Line 2, Line 2 pre-drying, and Line 4 produce fried potatoes.
Hashbrown line produces hashbrown potatoes
(this line does not have any emission points).
One product line produces mashed potatoes.
One product line produces special products.

The seven lines involve raw potatoes receiving, washing, peeling, trimming, cutting, drying, blanching, grading, shredding, batter applying (as in line 4), frying, freezing, packaging, and palletizing. The drying and frying parts of the lines emit criteria air pollutants in permissible quantities.

- Fuel Combustion Equipment – boilers (i.e., Boiler #1, Boiler #2, and Boiler #3); natural gas potatoe dryers; emergency diesel generators (i.e., 100 kW and 230 kW); heaters and burners.
- Paved and unpaved roads and material transfer.

A more detailed facility and process description is found in the Tier II Operating Permit application of April 7, 1999 and on the updated Tier II OP applications of April 25, 2000, and May 3, 2000.

PROJECT DESCRIPTION

This project is for the issuance of a Tier II OP for Lamb-Weston, Incorporated (LW), located in Twin Falls, Idaho. The Tier II OP is to limit the Potential to Emit (PTE) of any regulated air pollutant from the entire facility to below a hundred tons per year (100 T/yr), the major source threshold limit.

SUMMARY OF EVENTS

On May 15, 1995, LW at Twin Falls, Idaho submitted a Tier I OP application to the Idaho Department of Environmental Quality (DEQ) for review. The application was prepared by LW's consultant, Lambier Professional Group (LPG), in Portland, Oregon. On July 14, 1995, the application was determined incomplete. On August 14, 1995, LW requested from DEQ a 30-day extension to submit additional information. On September 13, 1995, LW submitted additional information to DEQ. After review, the application was determined administratively complete on November 13, 1995. On December 24, 1998, LW requested in a letter to DEQ to change the OP application from Tier I to Tier II. On April 7, 1999, LW submitted to DEQ a Tier II OP application, which was prepared by LPG. On May 5, 1999, DEQ requested from LW substantiation of a trade secret claim in the facility's Tier II OP application. On May 17, 1999, and April 25, 2000, DEQ received letters from LW withdrawing claims of confidentiality for all materials in the OP application. On June 21, 1999, the Tier II OP application was determined complete. On July 15, 1999, LW requested from DEQ a 30-day extension on processing their Tier II permit to enable the facility to work through details with the U.S. Environmental Protection Agency (EPA) Region 10 on the derating of Boiler #1 located at the facility. On August 13, 1999, DEQ solicited via phone additional information from LW. On December 6 through December 21, 1999, LW source tested for PM and VOC emissions from one of the fryer and dryer stacks at the facility. On October 14, 1999, Boiler #1 was source tested for NO_x and CO emissions from the boiler stack. On January 3, 2000, DEQ received a letter from EPA Region 10 indicating that LW's Boiler #1 was approved for the derating and is no longer subject to the requirements of 40 CFR 60 Subpart Db but is now subject to the New Source Performance Standard (NSPS) requirements of 40 CFR 60 Subpart Dc. On April 25, 2000, and May 3, 2000, DEQ received additional information from LW with a revised emission inventory and the PM-10 and NO_x modeling results from emission units at the facility. On August 2, 2000, DEQ issued a proposed Tier II OP to LW; and a public comment period was held from August 9 through September 8, 2000. On September 8, 2000, comments on the proposed Tier II OP and the technical analysis were submitted to DEQ by LW.

DISCUSSION

1. Process Description

This project is for a Tier II OP for the following existing point and fugitive emission sources:

Point Sources:

- 1.1 Line 1 Fryer -The Tier II OP application of April 7, 1999, shows that the fryer was constructed or modified in 1988 without applying for a Permit to Construct (PTC) prior to the construction or modification. The construction or modification to Line

1 Fryer occurred prior to the merger of LW with the Universal Frozen Foods Company. The merger took place on August 1, 1994.

Line 1 Fryer Specifications

Manufacturer:	Heat and Control
Model:	Custom
Maximum rated capacity:	25.28 (tons of finished potatoes/hr)

Line 1 Fryer Stack Specifications

Height:	49 (ft);
Exit diameter:	2.75 (ft);
Exit temperature:	150 (°F);
Exit gas flow rate:	29,300 actual cubic feet per minute (acfm);

Emissions from the Line 1 Fryer are controlled by a low-efficiency wet scrubber with the following specifications:

Manufacturer:	Gellert Company
Model Number:	Custom
Pressure Drop:	Not available (N/A)
Wet scrubber Flow:	235.2 gallons per min.

- 1.2 Line 2 Fryer - The Tier II OP application of April 7, 1999 shows that the fryer was constructed or modified in 1970 without applying for a PTC prior to the construction or modification. The construction or modification to Line 2 Fryer occurred prior to the merger of LW with the Universal Frozen Foods Company. The merger took place on August 1, 1994.

Line 2 Fryer Specifications

Manufacturer:	Heat and Control
Model:	None
Maximum rated capacity:	23.38 (tons of finished potatoes/hr)

Line 2 Fryer Stack Specifications

Height:	35 (ft);
Exit diameter:	2.00 (ft);
Exit temperature:	110 (°F);
Exit gas flow rate:	25,000 (acfm);

Emissions from the Line 2 Fryer are controlled by a low-efficiency wet scrubber with the following specifications:

Manufacturer:	Gellert Company
Model Number:	Custom
Pressure Drop:	N/A

Wet scrubber Flow: 132 inches of water

- 1.3 Line 4 Fryer - The Tier II OP application of April 7, 1999 shows that the fryer was constructed or modified in 1989 without applying for a PTC prior to the construction or modification. The construction or modification to Line 4 Fryer occurred prior to the merger of LW with the Universal Frozen Foods Company. The merger took place on August 1, 1994.

Line 4 Fryer Specifications

Manufacturer:	Heat and Control
Model:	None
Maximum rated capacity:	32.90 (tons of finished potatoes/hr)

Line 4 Fryer Stack Specifications

Height:	43.3 (ft);
Exit diameter:	3.00 (ft);
Exit temperature:	154 (°F);
Exit gas flow rate:	20,000 (acfm);

Emissions from the Line 4 Fryer are controlled by a low-efficiency wet scrubber with the following specifications:

Manufacturer:	Rey Industries
Model Number:	Custom
Pressure Drop:	N/A
Wet scrubber Flow:	138.6 inches of water

- 1.4 Special Products Fryer - The Tier II OP application of April 7, 1999 shows that the fryer was constructed or modified in 1977 without applying for a PTC prior to the construction or modification. The construction or modification to Special Products Fryer occurred prior to the merger of LW with the Universal Frozen Foods Company. The merger took place on August 1, 1994.

Special Products Fryer Specifications

Manufacturer:	Heat and Control
Model:	None
Maximum rated capacity:	4.64 (tons of finished potatoes/hr)

Special Products Stack Specifications

Height:	41 (ft);
Exit diameter:	4.00 (ft);

Exit temperature: 108 (°F);
Exit gas flow rate: 29,300 (acfm);

Emissions from the Special Products Fryer are controlled by a low-efficiency wet scrubber with the following specifications:

Manufacturer: Rey Industries
Model Number: Custom
Pressure Drop: N/A
Wet scrubber Flow: 246.4 inches of water

- 1.5 Line 1 Dryer - The Tier II OP application of April 7, 1999 shows that the Dryer was constructed or modified in 1986 without applying for a PTC prior to the construction or modification. The construction or modification to Line 1 Dryer occurred prior to the merger of LW with the Universal Frozen Foods Company. The merger took place on August 1, 1994.

Line 1 Dryer Specifications

Manufacturer: National
Model: S/N 53353
Maximum rated capacity: 29.45 (tons finished potatoes/hr)
Maximum Rated Capacity: 9.2 (MMBtu/hr)

Line 1 Dryer Stack Specifications (4 stacks)

Height: 48 (ft), each;
Exit diameter(s): 2.76 (ft), each;
Exit temperature: 200 (°F);
Exit gas flow rate: 25,000 (acfm), each stack;

- 1.6 Line 2 Pre-Dryer - The LW submittal of June 3, 1999 shows that the dryer was constructed or modified in July 1988 without applying for a PTC prior to the construction or modification. The construction or modification to Line 2 Pre-Dryer occurred prior to the merger of LW with the Universal Frozen Foods Company. The merger took place on August 1, 1994.

Line 2 Pre-Dryer Specifications

Manufacturer: National
Model: N/A
Maximum rated capacity: 28.73 (tons finished potatoes/hr)

Maximum Rated Capacity: 2 (MMBtu/hr)

Line 2 Pre-Dryer Stack Specifications (one stack)

Height: 36 (ft);
Exit diameter(s): 2.76 (ft);
Exit temperature: 200 (°F);
Exit gas flow rate: 12,000 (acfm);

- 1.7 Line 2 Dryer - The Tier II OP application of April 7, 1999 shows that the Dryer was constructed or modified in July 1988 without applying for a PTC prior to the construction or modification. The construction or modification to Line 2 Dryer occurred prior to the merger of LW with the Universal Frozen Foods Company. The merger took place on August 1, 1994.

Line 2 Dryer Specifications

Manufacturer: National
Model: N/A
Maximum rated capacity: 28.73 (tons finished potatoes/hr), steam operated

Line 2 Dryer Stack Specifications (6 stacks)

Height: 35 (ft) ,each;
Exit diameter(s): 2.25 (ft), each;
Exit temperature: 200 (°F);
Exit gas flow rate: 10,267 (acfm), each stack;

- 1.8 Line 4 Dryer - The Tier II OP application of April 7, 1999 shows that the dryer was constructed or modified in 1989 without applying for a PTC prior to the construction or modification. The construction or modification to Line 4 Dryer occurred prior to the merger of LW with the Universal Frozen Foods Company. The merger took place on August 1, 1994.

Line 4 Dryer Specifications

Manufacturer: National
Model: S/N 56475
Maximum rated capacity: 38.52 (tons finished potatoes/hr)
Maximum Rated Capacity: 13 (MMBtu/hr)

Line 4 Dryer Stack Specifications (5 stacks)

Height: 36 (ft) ,each;
Exit diameter(s): 3.91 (ft) for the 4 west dryer stacks (each)
and 3.00 (ft) for the 5th east stack;
Exit temperature: 121 (°F);

Exit gas flow rate: 22,250 (acfm) for the 4 west dryer stacks (each) and 20,000 (acfm) for the 5th east dryer stack;

- 1.9 Special Products Dryer - The LW submittal of June 3, 1999 shows that the dryer was constructed or modified in June 1976 without applying for a PTC prior to the construction or modification. The construction or modification to Special Products Dryer occurred prior to the merger of LW with the Universal Frozen Foods Company. The merger took place on August 1, 1994.

Special Products Dryer Specifications

Manufacturer:	B Eagle
Model:	N/A
Maximum rated capacity:	5.39 (ton finished potatoes/hr)
Maximum Rated Capacity:	2.1 (MM Btu/hr)

Special Products Dryer Stack Specifications (3 stacks)

Height:	31.5 (ft) for the north stack and 32 (ft) for the other 2 stacks;
Exit diameter(s):	3.00 (ft);
Exit temperature:	200 (°F);
Exit gas flow rate:	8,133 (acfm), each stack;

- 1.10 Boiler #1 -- Gas-fired boiler with a maximum rated capacity of 96.6 MM Btu/hr. The boiler was constructed in 1989 without obtaining a PTC from DEQ. However, on March 6, 1996, LW and DEQ signed the "Voluntary Consent Order" in which LW disclosed to DEQ their failure to obtain a PTC prior to the construction of the boiler and paid a fine of \$10,000. The Voluntary Consent Order is in Appendix B of this technical memorandum.

On November 20, 1995, EPA Region 10 issued a Compliance Order and Information Request regarding Boiler #1 to Lamb-Weston facility in Twin Falls -- see Appendix B.

On January 11, 1999, LW submitted a request to the U.S. EPA Region 10 to derate Boiler #1 from 150 MM Btu/hr to below 100 MM Btu/hr. LW's intention in derating the boiler is to make it operate under less restrictive regulations and be able to remove the Continuous Emissions Monitoring (CEM) system from the boiler. On April 20, 1999, LW submitted additional information to EPA regarding the derating of the boiler. On July 7, 1999, EPA Region 10 informed LW in writing that certain requirements are needed to satisfy the derating of the boiler. On December 27, 1999, DEQ and LW received a letter from EPA Region 10 in which EPA has determined that Boiler #1 is no longer subject to the requirements of 40 CFR 60 Subpart Db. The boiler is now subject to 40 CFR 60 Subpart Dc - Standards of Performance for Small Industrial-Commercial-Institutional Steam Generating Units. Please refer to Appendix B of this memo, which includes all the correspondence between LW and EPA Region 10 regarding the boiler derating.

Boiler #1 Specifications

Manufacturer:	Combustion Engineering;
Model:	TYPE 26-A-15;
Serial Number:	Contract No. 85672;
Burner:	CoEn (gas firing equipment added to 20D-5117-1); File no. 20D-0772-1; 183,190 SCFH @ 10.8 psig;
Fuel type:	Natural gas;
Maximum Rated Capacity:	96.6 (MMBtu/hr)

Boiler #1 Stack Specifications

Height:	46 (ft);
Exit diameter(s):	6.00 (ft);
Exit temperature:	600 (°F);
Exit gas flow rate:	34,304 (acfm);

- 1.11 Boiler #2 -- Gas-fired boiler with a maximum rated capacity of 72 MMBtu/hr. The Tier II OP application of April 7, 1999, shows that Boiler #2 was constructed or modified in 1982 without applying for a PTC prior to the construction or modification. The construction or modification to Boiler #2 occurred prior to the merger of LW with the Universal Frozen Foods Company. The merger took place on August 1, 1994.

The boiler is not subject to NSPS because it was constructed before June 9, 1989.

Boiler #2 Specifications

Manufacturer:	Murray-Trane;
Model:	MCF4-57;
Serial Number:	10846;
Burner:	CoEn 200 Series; File no. 20D-7342; 76,800 SCFH @ 4 psig;
Fuel Type:	Natural gas;
Maximum Rated Capacity:	72 (MMBtu/hr)

Boiler #2 Stack Specifications

Height:	40 (ft);
Exit diameter(s):	4.00 (ft);
Exit temperature:	590 (°F);
Exit gas flow rate:	25,327 (acfm);

- 1.12 Boiler #3 -- Gas-fired boiler with a maximum rated capacity of 36 MMBtu/hr. The Tier II OP application of April 7, 1999, and the LW submittal of June 3, 1999, show that Boiler #3 was constructed or modified in July 1969.

Boiler #3 Specifications

Manufacturer:	Cleaver-Brooks;
Model:	D-52;
Serial Number:	WL-1360;
Burner:	Springfield; 39,650 SCFH @ 4 psig;
Fuel Type:	Natural gas;
Maximum Rated Capacity:	36 (MMBtu/hr);

Boiler #3 Stack Specifications

Height:	38 (ft);
Exit diameter(s):	3.00 (ft);
Exit temperature:	600 (°F);
Exit gas flow rate:	12,784 (acfm);

Boiler #1 is normally used for base load and Boiler #2 is used for peak load with boiler #3 serving as a standby boiler.

- 1.13 Emergency Diesel Generators -- There are two emergency generators at the facility. The generators provide emergency power for portions of the plant, should electrical power be lost. The generators are normally run only for testing for approximately 12 hours each per year. The following are the generator and stack specifications:

- 1.13.1 100 kW Generator - Onan (166 hp; Model:100DGDB). The generator is located in the main building. The generator was constructed in July 1997.

Stack Design specification

Height:	13 ft;
Exit Diameter:	0.25 (ft);
Exit Gas Flow Rate:	800 (acfm);
Exit Temperature:	1060 (°F);

- 1.13.2 230 kW Generator - Onan, (355 hp; Model:230 Genset). The generator is located in the main building and was constructed in July 1976.

Stack Design Specifications

Height:	7 ft;
Exit Diameter:	0.5 (ft);
Exit Gas Flow Rate:	2370 (acfm);
Exit Temperature:	970 (°F);

Fugitive Sources:

- 1.14 Heaters and Burners Specifications .

<u>Unit Location</u>	<u>Make/Model</u>	<u>Date Installed</u>	<u>MMBtu/hr</u>
Boiler Room	Gellert	1970	1.50
Line 2 Frozen Grader	Gellert	1970	5.00
Hashbrown Packaging	Gellert	1970	5.00
Hashbrown Processing	Gellert	1970	3.00
Line 1 Packaging	Rapid	1977	6.50
Line1 MCC	Hartzell	1977	1.50
R & D Building	Rapid	1980	0.55
Line 1 MCC	Hartzel	1989	3.00
Line 4 Blancher	Rey	1989	8.00
Line 4 Dryer	Rey	1989	8.00
Line 4 Packaging	Rey	1989	5.00
Line 4 Palletizing	Hartzel	1989	2.50
Trane Boiler	Rey	1990	4.50
R & D Building	Rey	1991	1.25
Line 1 Fryer	Rey	1992	5.00
Peel Deck	Rey	1997	11.00
Cellar	King	1997	8.80
Line 2 Fryer*	Rey	1999	4.80
Special Products	N/A	1983	9.30
			Total: 94.20

* This unit was exempt from a PTC by DEQ on January 27, 1999.

1.15 Paved and Unpaved roads -- a description of the fugitive road dust emission sources at the facility is in the Tier II OP application (Section E and on page II-D-6-1).

1.16 Material Transfer -- a description of fugitive dust emissions from material transfer at the facility is in the Tier II OP application (SectionD; on pages II-D-5-1 and II-D-5-2).

It should be noted that there is a wastewater anaerobic digester which generates biogas (CH₄, H₂S, CO₂), which is then burned by flares at the facility. The digester is owned by the city of Twin Falls and is operated by a contractor, OMI. The digester treats LW's wastewater and LW claims that emissions from the flares are the responsibility of the city of Twin Falls according to the "Industrial Waste Agreement" between LW and the city of Twin Falls.

2. Area Classification

This facility is located in Twin Falls County. Twin Falls County is located in Air Quality Control Region (AQCR) 63 and Zone 11. The area is classified as attainment or unclassifiable for all federal and state criteria air pollutants (i.e., PM, CO, NO_x, VOC, and SO₂).

3. Facility Classification

Without state or federally enforceable permit conditions, this facility would be considered a major source of NO_x and CO, as defined in IDAPA 58.01.01.008.10. Upon issuance of this permit, the facility is no longer considered major, because the permit limits the facility's potential to emit (PTE) for NO_x and CO to below 100 T/yr, each. This facility is not a designated facility as defined in IDAPA 58.01.01.006.27. The facility's primary SIC code is 2099. The facility AIRS classification is A2.

4. Emission Estimates and Permit Requirements

Emission estimates were provided by LW's consultant, Lambier Professional Group Associates, Inc., and can be seen in the April 7, 1999 Tier II OP application and the revised permit applications that were submitted to DEQ on April 25, 2000 and May 3, 2000. DEQ also developed a spreadsheet to estimate emissions from the emissions units at the facility for the pollutants PM-10, NO_x, SO₂, CO, and VOC. Emission factors shown in the Tier II OP application were either developed from specific emissions testing performed at this facility from results of similar equipment testing at other LW potato facilities (as shown in LW's Tier II OP application of April 7, 99), or from EPA's AP-42 emission factors (EFs) if testing was not available. All emission estimates and the DEQ's emission spreadsheet and other related calculations are presented as Appendix A of this document. Emission calculations submitted within the application were checked for correctness and are also included in Appendix A.

4.1 Emissions from Fryers

There are four separate frying processing lines at Lamb-Weston's Twin Falls facility. Emissions from the fryers are mainly particulate matter (PM), particulate matter with an aerodynamic diameter less than or equal to ten microns (PM-10), and volatile organic compounds (VOC). LW conducted source tests to measure PM and VOC emissions from the Line 4 Fryer scrubber stack on December 6 through December 21, 1999. The purpose of the tests was to quantify the PM and VOC emissions from the fryers at the facility under worst-case operating conditions and to develop emission factors (EFs) for PM and VOC that can be used for emission calculations. The Line 4 Fryer was chosen to conduct such tests because it is the largest of the four lines and has the greatest capacity of finished potatoes product. PM-10 and VOC emission rates from Line 1, 2, 4, and the Special Products Fryers are calculated based on the EFs developed from source tests conducted at the Line 4 Fryer. The production rate of finished potatoes product in tons per hour for the Line 4 Fryer was reported during the source tests. For the purpose of developing the EFs, a 25% safety factor (SF) was added to the production rate measured during the source tests. This SF will allow for process variability when running different products. All PM emissions are assumed to be PM-10. Actual (or normal as shown in the spreadsheet in Appendix A) annual emissions are calculated based on operation for each fryer of 7,200 hours per year. Maximum annual emissions are calculated based on each fryer operating 8,760 hours per year at maximum production rates.

PM-10 and VOC performance tests will be required in the Tier II OP from the Line 4 Fryer stack on or before December 21, 2004, and at a minimum of once every five years thereafter. Results from the performance tests will be used to establish EFs and to determine compliance with the permitted PM-10 and VOC

emission limits from the fryers. When source tests are not performed, the permittee will demonstrate compliance with PM-10 and VOC emission limits through monitoring the daily production rates of finished potato product for each fryer and by using the EFs that are previously developed for PM-10 and VOC source tests to estimate those pollutant emissions for each fryer.

However, it should be noted that there is an AIRS emission factor for the VOC emissions for deep fat frying from cooking vats (SCC 30203601). That EF is 18.5 lbs of VOC/ton processed. If this EF were to be used to calculate the VOC emissions from the facility's fryers, the VOC emissions from the fryers would be greater than 250 tons per year, the Prevention of Significant Deterioration (PSD) threshold. Also, the VOC emissions would be greater than the major source threshold if the AIRS VOC EF is used to calculate emissions. Therefore, the OP requires including VOC source tests from the fryers to determine compliance with the VOC permitted emission limits.

The permittee is required to prepare an Operation and Maintenance (O&M) manual for each permitted source that has an air pollution control device(s). The manual must contain the operating parameters by which the air pollution control device(s) will be limited for correct operation. These parameters are pressure drop and scrubbing media flowrate, which must be monitored and recorded once daily. The parameters should be supported by manufacturer's documentation, if available.

4.2 Emissions from Dryers

There are four potato dryers at the LW facility. Dryers are used to drive off unwanted moisture from the potatoes prior to entering the fryers. The Line 1 Dryer, Line 2 Pre-Dryer, Line 4 Dryer, and the Special Products Dryer are operated exclusively on natural gas. The Line 2 Dryer is operated on steam. Emissions from the natural gas-fired dryers are mainly PM, PM-10, VOC, carbon monoxide (CO), oxides of nitrogen (NO_x), and trace amounts of sulfur dioxide (SO₂). Emissions from the Line 2 Dryer are PM and PM-10. LW conducted source tests to measure PM and VOC emissions from one of the stacks of the Line 4 Dryer on December 6 through December 21, 1999. The Line 4 Dryer has five drying zones; each zone has its own stack. Zone #5 was chosen because it was most conducive to stack testing in configuration and location. The purpose of the tests was to quantify the PM and VOC emissions from the dryers at the facility under worst-case operating conditions and to develop emission factors (EFs) for PM and VOC that can be used for emission calculations. The Line 4 Dryer was chosen to conduct such tests because it is the largest of the four dryers and has the greatest capacity for drying potatoes. PM-10 and VOC emission rates from Lines 1, 2, 4, and the Special Products Dryers are calculated based on the EFs developed from source tests conducted at the Line 4 Dryer. The results of PM and VOC emission tests of Line 4 Dryer, zone #5 were multiplied by five (5) to account for the emissions from all Line 4 Dryer stacks. The production rate of finished potatoes in tons per hour for the Line 4 Dryer was reported during the source tests. For the purpose of developing the EFs, a 25% SF was added to the production rate measured during the source tests. This SF will allow for process variability when running different products.

All PM emissions are assumed to be PM-10. Actual (or normal as shown in the spreadsheet in **Appendix A**) annual emissions are calculated based on operation for each fryer of 7,200 hours per year. Maximum annual emissions are calculated based on each fryer operating 8,760 hours per year at maximum production rates.

The pollutants resulting from natural gas combustion are PM-10, SO₂, CO, NO_x, and VOC. Emission rates of these pollutants from Line 1, 2 (Pre-Dryer), 4, and the Special Products Dryers are calculated based on EFs found in EPA's AP-42, 3/98, Section 1.4, natural gas combustion.

PM-10 performance tests will be required in the Tier II OP from the Line 4 Dryer stack on or before December 21, 2004, and at a minimum of once every five years thereafter. Results from the performance tests will be used to establish EFs and to determine compliance with the permitted PM-10 emission limits from the dryers. When source tests are not performed, the permittee will demonstrate compliance with PM-10 emission limits through monitoring the daily and annual production rates of finished potatoes product for each dryer and by using the EFs that are previously developed for PM-10 source tests to estimate emissions from each of the dryers. Also, the potato dryers will be required to be operated on natural gas exclusively.

The SO₂, CO, and VOC emissions from the potato dryers are inherently limited at maximum operation for each dryer. Emissions for each pollutant are well below 100 T/yr when the dryers are operated at maximum capacity. Therefore, these pollutants are not included in the OP -- refer to **Table 1, Appendix A** for the SO₂, CO, and VOC calculated emissions from the dryers.

Table 1 in Appendix A shows that NO_x has a Potential to Emit (PTE) of greater than 100 T/yr, the major source threshold limit from the entire facility. Since NO_x is emitted in the greatest amount from the combustion units at the facility, the NO_x emission limits from the dryers are included in the OP to limit that pollutant PTE from the dryers and from other combustion sources at the facility to below the 100 tons per year threshold of NO_x emissions.

4.3 Emissions from Boilers

The three boilers that exist at the facility are Boiler #1, Boiler #2, and Boiler #3. Specifications for the boilers are in Sections 1.10, 1.11, and 1.12 of this memorandum. All of the boilers are operated exclusively on natural gas. Pollutants emitted from the boilers are mainly PM/PM-10, VOC, CO, SO₂, and NO_x. Emission rates are estimated as follows:

4.3.1 Emissions from Boiler #1:

This boiler was derated from the NSPS 40 CFR 60 Subpart Db to NSPS 40 CFR 60 Subpart Dc by EPA Region 10 on December 27, 1999.

LW conducted source tests to measure NO_x and CO emissions from the boiler stack on October 14, 1999. The purpose of the tests was to quantify the NO_x and CO emissions from the boiler stack and to develop emission factors for NO_x and CO that can be used for emission

calculations. NO_x is the pollutant emitted in the greatest amount from the boiler. LW intended to become a synthetic minor facility by limiting the PTE of NO_x emissions to less than 100 tons per year (T/yr) from the entire facility. The NO_x EF that applies to LW's Boiler #1 is 100 lb/MM scf of natural gas burned, as per Table 1.4-1, EPA's AP-42, 3/98. By using EPA's AP-42 EF for NO_x and the boiler maximum capacity (96.6 MM BTU/hr), the NO_x maximum emissions are estimated to be 41.48 T/yr (i.e., $100/83.73 \times 34.73 = 41.48$). However, the EF for NO_x that was developed from the source test on the boiler stack is estimated at 83.73 lb/MM scf. Based on that EF, the maximum NO_x emissions from the boiler is estimated to be 34.73 T/yr. The lower NO_x EF for Boiler #1 resulted in reduction of NO_x emissions from the boiler of approximately seven tons per year. Also, the great reduction in NO_x emissions from the boiler was actually due to the derating of the boiler from 40 CFR 60 Subpart Db to 40 CFR 60 Subpart Dc, which resulted in a lower EF for NO_x . The carbon monoxide (CO) EF developed from the source test is estimated to be 33.2 lb/MM scf. Using this EF, the resulting CO emissions from the boiler are estimated to be 13.77 T/yr, compared with 34.84 T/yr when EPA's AP-42 EF was used for the calculations (i.e., $84/33.2 \times 13.77 = 34.84$). No emission limit is set in the OP for the CO from the boiler.

The PM/PM-10, VOC, and SO_2 emissions from the boiler are estimated by using EFs from Table 1.4-1, AP-42, 3/98. All PM emissions are assumed to be PM-10. Actual annual emissions are calculated based on boiler operation of 7,800 hours per year. Maximum annual emissions are calculated based on operation of 8,760 hours per year and on maximum combustion rated capacity of the boiler. No emission limits are set in the OP for VOC and SO_2 because they are inherently limited at the maximum operation of the boiler. Table 1, Appendix A of this memo shows all emission calculations for all pollutants at the facility.

Since NO_x is the pollutant emitted in the greatest amount from the boiler and from the facility in general, a natural gas combustion limit from Boiler #1 is set in the operating permit. Natural gas will be burned exclusively in the boiler.

The permittee will monitor and record the amount of natural gas used for Boiler #1 on a daily basis, as required in 40 CFR 60.48c(g). The permittee will submit a written notification to EPA Region 10 and to DEQ following procedures listed in 40 CFR 60.48c(a).

When it approved the derating of Boiler #1, EPA requested further requirements from LW in the letter sent to the company on December 27, 1999. LW will continue to monitor and maintain records of the natural gas flow rate on a continuous basis. LW will read and record the natural gas flow rate (ft^3/min) no less frequently than on a continuous basis. LW will report to EPA Region 10 and to Idaho DEQ on a quarterly basis the natural gas-fired heat input of Boiler #1 (MM Btu/hr) for each boiler

operating day. All of these requirements are incorporated into the operating permit.

Compliance with the PM-10 emission limits from the boiler will be demonstrated by firing the boiler on natural gas exclusively.

Particulate matter (PM) emission from the boiler will not exceed 0.015 grains per dry standard cubic foot of effluent gas adjusted to three percent (3%) oxygen by volume when natural gas is combusted, as required in IDAPA 58.01.01.675. So long as the boiler is fueled exclusively on natural gas, the likelihood that the grain loading standard will be exceeded is considered insignificant. Therefore, the only method that will be used to determine compliance with IDAPA 58.01.01.675 is to require that the boiler be fueled only with natural gas.

4.3.2 Emissions from Boiler #2 and Boiler #3:

Emission rates for PM/PM-10, VOC, CO, SO₂, and NO_x are calculated based on EFs found in EPA's AP-42, 3/98, Section 1.4, natural gas combustion. All PM emissions are assumed to be PM-10. Actual annual emissions are calculated based on operation for each boiler of 7,800 hours per year. Maximum annual emissions are calculated based on operations for each source of 8,760 hours and on maximum production rates. Please refer to Table 1, Appendix A for the emission calculations from Boilers #2 and #3.

Compliance with the PM-10 and NO_x emission limits from the boilers will be demonstrated by firing the boilers on natural gas exclusively.

Particulate matter (PM) emissions from Boiler #2 and Boiler #3 will not exceed 0.015 grains per dry standard cubic foot of effluent gas for each boiler adjusted to three percent (3%) oxygen by volume when natural gas is combusted, as required in IDAPA 58.01.01.675. So long as the boilers are fueled exclusively on natural gas, the likelihood that the grain loading standard will be exceeded is considered insignificant. Therefore, the only method that will be used to determine compliance with IDAPA 58.01.01.675 is requiring the boilers be fueled only with natural gas.

4.4 Emissions from the Heaters and Burners

There are nineteen (19) heaters and burners at different locations at the facility. The specifications for the heaters and burners and the buildings where the heaters and burners are located are in Section 1.14 of this memorandum. All of the heaters and burners are operated exclusively on natural gas. Pollutants emitted from the heaters and burners are mainly PM/PM-10, VOC, CO, SO₂, and NO_x. Pollutant emissions from these sources are fugitive. Fugitive emission rates are estimated from these sources based on the total natural gas consumption of 94.2 MM Btu/hr and by using EFs from EPA's AP-42, Section 1.4, natural gas combustion. The actual and maximum operation hours for the heaters and burners are 7,200 and 8,760 hours per year, respectively. Table 1,

Appendix A shows the emission calculations. In this technical analysis, the pollutant of concern from the heaters and burners combustion is NO_x . NO_x emissions from the heaters and burners will be added to the total NO_x emissions from the entire facility to limit its PTE. Total annual NO_x emissions from the heaters and burners are estimated to be 3.75 T/yr. To limit the NO_x emissions from the heaters and burners at its permitted level, natural gas will be burned exclusively in those units.

4.5 Emissions from the Emergency Diesel Generators

There are two Emergency Diesel Generators at the facility. Specifications for the generators are in Section 1.13 of this memorandum. Emissions from the Emergency Diesel Generators are calculated by the permittee and by DEQ. EFs from EPA's AP-42, Section 3.3, Gasoline and Diesel Industrial Engines, 10/96 are used for the calculations. Emission calculations are included in Table 1, Appendix A of this memo and in LW's OP application. The pollutants of concern in this technical analysis are PM-10 and NO_x emissions. NO_x emissions are included in the OP to limit the PTE for that pollutant from the generators. Annual NO_x emissions from the generators are limited in the OP at 3.73 T/yr per any consecutive 12-month period. Compliance with this limit can be determined by hours of operation limitations of a maximum of 500 hours per year for each generator. The PM-10 emission limits from the generators are set at 0.87 lbs/hr in the OP. The emission rate limits are based on the hours of operation limitations (8.5 hrs/day) determined through modeling. Please refer to Section 5 of this memo for more information on PM-10 modeling from the generators.

The permittee is required to monitor and record the date and daily and annual hours of any operations for each of the emergency generators.

The operating permit requirements also include a PM grain loading limit (i.e., 0.05 gr/dscf) in accordance with IDAPA 58.01.01.675. The sulfur content in No.2 diesel fuel that is burned in the generators shall be less than five-tenths weight percent (0.5 wt%), as per IDAPA 58.01.01.728.

The facility has two diesel storage tanks with capacities of 90 gallons and 575 gallons. Emissions of VOC from the storage tanks are very small due to the small size of the tanks. These emissions are not included in this OP.

4.6 Emissions of NO_x and CO from the Natural Gas Combustion Units at the Facility and other Facility-Wide Requirements

In the Facility-Wide Conditions of this Tier II OP, a limit on natural gas combustion from the entire facility was set at 1,844 MM cubic feet (cf) per any consecutive 12-month period. As stated before in this technical memo, NO_x is the pollutant emitted in the greatest amount from the natural gas combustion units at the facility. If one takes the worst case assumption that NO_x EF is 100 lbs/ 10^6 cf for each emission unit that combusts natural gas at the facility (note: NO_x EF for Boiler #1 is actually less than 100 lbs/ 10^6 cf), the facility's NO_x emission limits are estimated to be 92.20 T/yr (i.e., $1,844 \times 10^6$ cf/yr \times 100 lbs

/10⁶ cf x 1 ton / 2000 lbs = 92.2 T/yr). To limit the facility to this amount of NO_x emissions, the total maximum natural gas consumption for the entire facility must be limited to less than or equal to 1,844 million cubic feet per year (1,844 MM cf/yr). Thus, based upon the emission inventory information provided by LW, the facility would be below the 100 tons per year threshold of NO_x emissions.

The maximum CO emissions from the entire facility as shown in Table 1, Appendix A are greater than 100 T/yr. By limiting the natural gas consumptions of 1844 MM cf/yr, the CO emissions will be below the 100 T/yr, the major source threshold for that pollutant.

Compliance determination for natural gas consumption can be verified by monitoring and recording the date and amount of natural gas burned in cubic feet (cf) per month and the cf per any consecutive 12-month period. These requirements are incorporated into the operating permit.

All stacks, vents, and other openings at the facility must comply with the opacity rules as specified in IDAPA 58.01.01.625. In addition to the opacity requirements, any fugitive emissions generated from facility operations must not be seen crossing the facility boundary.

The permittee is required to reasonably control fugitive emissions per IDAPA 58.01.01.651.

The permittee is required to comply with the provisions of IDAPA 58.01.01.600-616 for open burning.

The permittee is required to comply with the excess emissions requirements as set in IDAPA 58.01.01.130-136.

4.7 Fugitive Emissions from Paved/Unpaved Roads and from Transfer Operations at the Facility

Fugitive particulate emissions from paved and unpaved roads and from transfer operations were calculated by the permittee by using EFs from EPA's AP-42, Sections 13.2.1 and 13.2.2. Fugitive emissions calculations can be seen in the application materials. All fugitive emissions from the facility shall be controlled in accordance with IDAPA 58.01.01.650 of the Rules – see the Facility-Wide Conditions in the operating permit

5. Modeling

LPG conducted ISCST3 modeling for the PM-10 and NO_x emissions from the LW facility in Twin Falls, Idaho. The predicted PM-10 and NO_x impacts were determined to be below the National Ambient Air Quality Standards (NAAQS).

The PTE calculations were used for modeling of 24-hr and annual PM-10 and NO_x emission rates from the natural gas combustion units (i.e., dryers and boilers) at the

facility. The modeling results showed that PM-10 and NO_x NAAQS were not exceeded at these emission rates.

Mary Walsh, State Technical Services Meteorologist at IDEQ, reviewed LPG's modeling results. The following is a summary of Ms. Walsh's review:

As part of the Tier II Operating Permit process, Lamb-Weston, located in Twin Falls, carried out a modeling analysis to show compliance with the National Ambient Air Quality Standards (NAAQS) for PM₁₀ and NO_x. Using the EPA-approved ISCST3 model with regulatory default options, rural dispersion, and five years' worth of meteorological data from the National Weather Service (NWS), the facility evaluated the ambient impacts of 28 sources of PM₁₀ and 18 sources of NO_x. Due to a lack of model-ready meteorological data from the Twin Falls area, it was recommended that the facility look into using data from the NWS sites here in Idaho. Carrying out a comparative analysis of historical data for Twin Falls, Pocatello and Boise, the facility showed the surface data in Pocatello to be more closely representative of conditions within the Twin Falls area.

Following further guidance from IDEQ, an extensive receptor grid, with elevation data obtained from the USGS Digital Elevation Model (DEM), was placed in those areas constituting ambient air (i.e. those to which the public has access). Upon determining the area of maximum impact, additional receptors were added to ensure that the maximum ambient concentration had, in fact, been resolved. Discrete receptors were also located at all points within 4 km of the plant identified as having an increased sensitivity to changes in ambient pollutant concentrations. Known as sensitive receptors, these points included schools, hospitals and day care and retirement centers. An evaluation of the predicted impacts at these sites showed concentrations well below those of the applicable standards. The effects of building downwash, which can lead to high impacts near a source due to the distortion of flow around buildings, was also included in the analysis. All buildings located within the facility boundary, along with those owned by Henningsen Cold Storage, Longview Fibre, and the Farm House Collection were evaluated for their potential wake affects.

Due to its proximity to ambient air, it was found that the 230 kW generator contributed the most to the maximum modeled PM₁₀ impact. This impact was found to occur along Minidoka Avenue (which is located between the main plant and the dry storage area). In order to show compliance with the NAAQS, federally enforceable limitations were proposed for the facility's generators to help reduce daily and annual PM₁₀ impacts from these sources. As such, the facility has agreed to limit the operation of their generators to 500 hours per year and 8.5 hours per day. These limitations were factored into the PM₁₀ emission rates modeled for these sources.

Using a conservative PM₁₀ background value of 94 g/m³, obtained from IDEQ and based upon the maximum concentrations measured at the Twin Falls site over the last three years, the facility's ambient PM₁₀ impacts were found to meet all applicable requirements. In lieu of actual monitoring data in the Twin Falls area for NO_x, a conservative statewide background concentration of 40 g/m³ was applied in the analysis. This value was based upon historical data obtained from IDEQ's ambient monitoring network and discussions with EPA and other state environmental agencies in

the Pacific Northwest. A review of the submitted materials by staff from IDEQ Technical Services showed the analysis to meet IDEQ requirements as long as the hour-of-operation limitations imposed upon the generators are followed.

The ISCST3 modeling input and results are shown in **Appendix D** of this memo.

6. Regulatory Review

This Tier II OP is subject to the following permitting regulations:

<u>IDAPA 58.01.01.006</u>	Definitions;
<u>IDAPA 58.01.01.401</u>	Tier II Operating Permit;
<u>IDAPA 58.01.01.402</u>	Application Procedures;
<u>IDAPA 58.01.01.403</u>	Permit Requirements for Tier II Sources;
<u>IDAPA 58.01.01.404</u>	Procedures for Issuing Permits;
<u>IDAPA 58.01.01.405</u>	Conditions for Tier II Operating Permits;
<u>IDAPA 58.01.01.406</u>	Obligation to Comply;
<u>IDAPA 58.01.01.470</u>	Permit application Fees for Tier II Permits;
<u>IDAPA 58.01.01.625</u>	Visible Emissions;
<u>IDAPA 58.01.01.650</u>	General Rules for Control of Fugitive Dust;
<u>IDAPA 58.01.01.675</u>	Fuel Burning Equipment -- Particulate Matter;
<u>IDAPA 58.01.01.728</u>	Distillate Fuel Oil, and
<u>40 CFR 60 Subpart Dc</u>	Standards of Performance for Small Industrial-Commercial-Institutional Steam Generating Units.

7. AIRS Information

Information necessary to the AIRS database is included as **Appendix C** of this technical memorandum.

8. Fees

Upon issuance of a Tier II OP, this facility will no longer be considered a major facility as defined in IDAPA 58.01.01.008.14. Therefore, registration and registration fees, in accordance with IDAPA 58.01.01.526 are not applicable upon issuance of this permit.

Permit application fees of five hundred dollars (\$500.00), in accordance with IDAPA 58.01.01.470, are applicable.

RECOMMENDATION

Based on the review of the Operating Permit application and on applicable state federal regulations concerning the permitting of air pollution sources and public comments received, DEQ staff recommends that Lamb-Weston, Inc. in Twin Falls be issued a Tier II Operating Permit No.083-00062 for the sources existing at the facility. A public comment period was held from August 9, to September 8, 2000 in accordance with IDAPA 58.01.01.404.02.b. Staff also recommends that the facility be notified of the Tier II permit fee requirement in writing. This fee will be applicable upon issuance of this permit.

HAE/bm

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cc: Twin Falls Regional Office
DEQ State Offices